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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,203	02/12/2004	Rajiv Yadav Ranjan	50103-553	2760

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Washington, DC 20005-3096

EXAMINER

MCDONALD, RODNEY GLENN

ART UNIT	PAPER NUMBER
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1753

MAIL DATE	DELIVERY MODE
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07/09/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/776,203

Applicant(s)

RANJAN ET AL.

Examiner

Rodney G. McDonald

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 15-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-11, 13 and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (Japan 56-152963) in view of Hedgcoth (U.S. Pat. 4,894,133).

Regarding claims 1, 13, Kobayashi et al. teach a cathode sputtering apparatus and method for forming a uniform thickness layer on at least one surface of at least one workpiece in a multi-stage process comprising deposition of a plurality of sub-layers. Kobayashi et al. teach a first group of spaced apart cathode/target assemblies 15, 16. The substrate is moved to be concentric with each of the targets. Each cathode/target

assembly is oriented to be substantially parallel to the first surface of the substrate. The group of cathodes 15, 16 is adapted to provide sublayers with different sputtered film thickness profiles, such the sublayers form a uniform thickness profile. In order to achieve the uniform thickness profile the cathode/target assemblies are placed at different distances from the substrate. (See Abstract; Fig. 4; Fig. 5)

The differences between Kobayashi et al. and the present claims is that the transportation means is not discussed (Claim 1), a second set of targets to coat a second side of the substrate is not discussed (Claims 2, 13), the cathode targets being in substantial vertical registry is not discussed (Claim 3, 15), the cathode/target assemblies of the first and second groups of cathode/target assemblies located within a single vacuum chamber is not discussed (Claim 4), the cathode/target assemblies of said first and second groups of cathode/target assemblies form an in-line or a circular-shaped arrangement within said vacuum chamber is not discussed (Claims 5, 16), the cathode/target assemblies of said first and second groups of cathode/target assemblies are located in a plurality of vacuum chambers is not discussed (Claims 6, 17), the plurality of vacuum chambers forming an in-line or a circularly-shaped arrangement of chambers is not discussed (Claim 7), each cathode/target assembly of said first and second groups of cathode/target assemblies is a planar magnetron cathode/target assembly including a magnetron magnet means is not discussed (Claims 8, 18), the magnetron magnet means of at least some of the planar magnetron cathode/target assemblies are of different lengths, widths or diameters is not discussed (Claims 9) and the means for transporting the at least one substrate/workpiece past the first and

Art Unit: 1753

second groups of cathode/target assemblies for deposition of the first and second pluralities of sub-layers comprises means for mounting and transporting at least one disk-shaped substrate/workpiece is not discussed (Claims 11, 20).

Regarding claim 1, Hedgcoth teach providing a means for carrying workpieces in vertical alignment. (Column 4 lines 31-33)

Regarding claim 2, Hedgcoth teach providing targets to coat both sides of a substrate. (See Fig. 1; Column 4 lines 31-35)

Regarding claim 3, Hedgcoth suggest locating target in vertical registry. (See Figs. 1 and 2)

Regarding claim 4, Hedgcoth locating targets 42 in a single vacuum chamber. (See Figs. 1 and 2)

Regarding claim 5, Hedgcoth suggest an in-line arrangement. (See Figs. 1 and 2)

Regarding claim 6, Hedgcoth suggest locating targets 42 and 44 in different vacuum chambers. (See Figs. 1 and 2; Column 4 lines 7-8)

Regarding claim 7, Hedgcoth suggest the plurality of vacuum chamber arranged in-line. (See Figs. 1 and 2)

Regarding claims 8, 18, Hedgcoth suggest that the targets should be magnetron targets. (Column 4 lines 33-35; Column 4 lines 52-55)

Regarding claim 9, Kobayashi et al. teach changing the target sizes. Since the targets are of different sizes it would follow that magnetrons utilized would be of different lengths and widths. (See Kobayashi et al. discussed above)

Art Unit: 1753

Regarding claim 11, Hedgcoth suggest means 6 for transporting and mounting at least one disk shaped workpiece. (Column 4 line 4; Fig. 2)

Regarding claim 15, Hedgcoth suggest locating target in vertical registry. (See Figs. 1 and 2) Hedgcoth teach forming coatings on each of the first and second surface simultaneously. (See Figs. 1, 2)

Regarding claim 16, Hedgcoth suggest an in-line arrangement. (See Figs. 1 and 2)

Regarding claim 17, Hedgcoth suggest the plurality of vacuum chambers arranged in-line. (See Figs. 1 and 2)

Regarding claim 20, Hedgcoth suggest means 6 for transporting and mounting at least one disk shaped workpiece. (Column 4 line 4; Fig. 2)

The motivation for utilizing the features of Hedgcoth is that it allows for producing magnetic disks. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Kobayashi et al. by utilizing the features of Hedgcoth because it allows for producing magnetic disks.

Claims 12 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. in view of Hedgcoth as applied to claims 1-11,13 and 15-20 above, and further in view of Mukai et al. (U.S. Pat. 5,441,615).

The difference not yet discussed is the use of shield members. (Claims 12 and 21)

Art Unit: 1753

Regarding claims 12, 21, Mukai et al. teach utilizing deposition shield members for targets. (Column 3 lines 30-32)

The motivation for utilizing the features of Mukai et al. is that it allows for preventing sputtered particles from dispersing to the outside of the deposition shield members. (Column 2 lines 61-65)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Mukai et al. because it allows for preventing sputtered particles from dispersing to the outside of the deposition shield members.

Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. in view of Hedgcoth as applied to claims 1-11 and 13-20 above, and further in view of Nasu et al. (U.S. Pat. 5,326,637).

The differences not yet discussed is depositing a perpendicular magnetic recording medium on a magnetically soft underlayer (claim 22) and the magnetic soft underlayer being 500 to 4,000 Angstroms and being Fe or Fe-Co (claim 23).

Regarding claim 22, Nasu et al. teach depositing a magnetic recording medium by sputtering on a magnetically soft underlayer. (See Abstract)

Regarding claim 23, the magnetic soft underlayer can be Fe, Fe-Co. (See Abstract). The thickness can be 500 Angstroms. (Column 5 lines 28-35)

The motivation for utilizing the features of Nasu et al. is that it allows for producing a film with high recording density and reproduction output. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Nasu et al. because it allows for producing a film with high recording density and reproduction output.

Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable Kobayashi et al. (Japan 56-152963) in view of Hedgcoth (U.S. Pat. 4,894,133).

Regarding claims 24, Kobayashi et al. teach a cathode sputtering apparatus for forming a uniform layer of selected material on at least one surface of at least one/substrate/workpiece. Kobayashi et al. teach a group of spaced apart deposition stations 15, 16. The stations have circular targets since the substrate is moved to be "concentric" with the targets 15, 16. Each target can have a different size (i.e. diameter because of the concentric relationship between target and substrate) to deposit different sublayers such that the total thickness of the layer is uniform. (See Abstract)

The differences between Kobayashi et al. and the present claims is that utilizing a magnetron for the targets and means for transporting the substrates is not discussed (Claim 24) and utilizing a second group of targets to coat a second side of the substrate is not discussed (Claim 25).

Regarding claims 24 and 25, Hedgcoth teach providing a means for carrying workpieces in vertical alignment. (Column 4 lines 31-33) Hedgcoth teach providing targets to coat both sides of a substrate. (See Fig. 1; Column 4 lines 31-35) Hedgcoth suggest that the targets should be magnetron targets. (Column 4 lines 33-35; Column 4 lines 52-55)

The motivation for utilizing the features of Hedgcoth is that it allows for producing magnetic disks. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Kobayashi et al. by utilizing the features of Hedgcoth because it allows for producing magnetic disks.

Response to Arguments

Applicant's arguments filed April 18, 2007 have been fully considered but they are not persuasive.

In response to the argument that the prior art does not teach spacing at least one target at a different distance than the other target in the group, it is argued that Kobayashi et al. teach spacing targets at different distances from a substrate in order to form a total uniform layer. Target 15 deposits a first layer and target 16 deposits a second layer. The sum of the two layers form a total uniform layer. Additional electrodes 3 and 4 can be utilized. (See Kobayashi et al. Abstract; Fig. 4, 5)

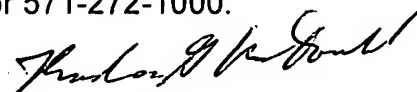
This action will be made NON-Final based on the newly cited reference to Kobayashi et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M-TH with every Friday off..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1753

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Rodney G. McDonald
Primary Examiner
Art Unit 1753

RM
July 3, 2007